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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,297	06/19/2001	Lonnie O'Neal Ingram	49950-59776	2679
21874	7590	05/20/2004	EXAMINER	
EDWARDS & ANGELL, LLP			RAO, MANJUNATH N	
P.O. BOX 55874			ART UNIT	
BOSTON, MA 02205			PAPER NUMBER	

1652

DATE MAILED: 05/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/885,297

**Applicant(s)**

INGRAM ET AL.

**Examiner**

Manjunath N. Rao, Ph.D.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 44-49, 51-53, 55-59, 97-99, 101, 102 and 104 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 44-49, 51-53 and 55-59 is/are allowed.
- 6) ☒ Claim(s) 97-99 and 101-102, 104 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6-30-03.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

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### **DETAILED ACTION**

Claims 44-49, 51-53, 55-59, 97-99, 101-102, 104 are currently pending and are present for examination.

Applicants' amendments and arguments filed on 3-11-04, have been fully considered and are deemed to be persuasive to overcome the rejections previously applied. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. Specifically Examiner has withdrawn all previous rejections in view of claim amendments and persuasive arguments presented by the applicants. However, Examiner has placed new rejections.

#### ***Sequence Compliance***

Applicant is required to comply with the sequence rules by inserting the sequence identification numbers of all sequences recited within the claims and/or specification. It is particularly noted that applicants fail to provide SEQ ID NO for the sequence in figure 14. See particularly 37 CFR 1.821(d).

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patent ability shall not be negated by the manner in which the invention was made.

Claims 97-99, 101-102, 104 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyer et al. (Eur J. Biochem, Vol. 162 :311-316, 1987 cited in IDS as A19) and Zhou et al.

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(J. Industrial Microbiol. Biotechnol., 1999, Vol. 22:600-607). Claims 97-99, 101-102, 104 are drawn to a recombinant host cell suitable for degrading an oligosaccharide or suitable for reducing the viscosity of an oligosaccharide wherein said cell is transformed with a vector expressing two endoglucanases *celY* and *celZ* derived from *Erwinia* sp. under the control two surrogate promoters, wherein the cell is a bacterial cell belonging to enterobacteriaceae and is either *Escherichia* sp. or *Klebsiella* sp. and wherein the endoglucanases are called as EGZ or EGY.

Zhou et al. teach the engineering of a *Klebsiella* strain for production of ethanol on an industrial scale using lignocellulosic wastes. After providing the state of the art in engineering ethanologenic microorganisms, the reference teaches methods and also provides a *Klebsiella* strain which has the native ability to metabolize a variety of cellulose substrates and comprising a single endoglucanase derived from *Erwinia* linked to a surrogate promoter derived from *Z.mobilis* and additional ethanologenic enzymes. The reference also teaches that the above bacterial strain also has the additional “*out*” gene encoding the type II protein secretion system. Thus the above reference teaches all aspects of the above claims except for the fact that the host cell does not have two endoglucanase genes which are synergistic with each other.

Boyer et al. teach the characterization of a new endoglucanase from *Erwinia* sp. and call the enzyme as *CelY*. The reference teaches the occurrence of two endoglucanases in *Erwinia* sp. and provides the gene encoding the same.

Using the teachings of the above two references it would have been obvious to one of ordinary skill in the art to improve the host cell already taught by Zhou et al. by introduction of the newly characterized *CelY* in order to provide the host cell with additional power to hydrolyze

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cellulose and use the glucose towards fermentation, thereby increasing the overall fermentation efficiency of said host cell. Using the clone provided by Boyer et al., it would be obvious to one of ordinary skill in the art to link such endoglucanase sequences to promoter sequences taught by Zhou et al. and transform *Klebsiella oxytoca* P2 strain developed as a biocatalyst for SSF as taught by Zhou et al. One of ordinary skill in the art would have been motivated to do so as there is a great demand for such highly efficient ethanologenic organisms that are capable of producing ethanol, an industrial solvent and fuel, inexpensively from cellulose wastes. One of ordinary skill in the art would have a reasonable expectation of success since Zhou et al. already provide an ethanologenic strain of *Klebsiella* comprising a single endoglucanase of *Erwinia* as well all the methods and promoters for the same and Boyer et al. provide the additional endoglucanase.

Therefore the above claims would have been *prima facie* obvious to one of ordinary skill in the art.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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***Allowable Subject Matter***

Claims 44-49, 51-53, 55-59 are allowable. Examiner has withdrawn the previous rejections made against above claims in view applicant limiting the claims to the synergistic action of CelY and CelZ derived from *Erwinia* as well as due to the applicant's showing of support in the specification for the phrase "derived from *Erwinia*" to mean as isolated from *Erwinia* only and not from any other source.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Manjunath N. Rao, Ph.D. whose telephone number is 571-272-0939. The Examiner can normally be reached on 7.00 a.m. to 3.30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Ponnathapura Achutamurthy can be reached on 571-272-0928. The fax phone numbers for the organization where this application or proceeding is assigned is 703-872-9306 for regular communications and for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1600.



MANJUNATH RAO  
PATENT EXAMINER

Manjunath N. Rao  
May 19, 2004